Project Overview

Intern: Maria Carter
Major: Biological Systems Engineering
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Background

As part of the Nebraska Industrial Assessment Center (NIAC) team, the intern assessed five manufacturing facilities. The first assessment the intern attended was Vishay Dale in Columbus, NE, which manufactures resistors. The intern was the lead analyst on the second assessment she attended at the Wastewater Treatment Plant in Norfolk, Nebraska. The third assessment the intern attended was Becton-Dickinson in Holdrege, NE, which manufactures medical syringes. The intern's fourth assessment was at ASSA ABLOY – Curries in Mason City, IA, which was a steel door manufacturer. Lastly, the fifth assessment the intern attended was at Nebraska Nitrogen in Geneva, NE, which produces anhydrous ammonia fertilizer.

Project Description

As part of these assessments, examples of the recommendations that were prepared include:

- Implement a compressed air leak detection program to reduce excessive electricity use. Detecting and repairing compressed air leaks can greatly save on electricity usage and accrue significant electricity cost savings.
- Install a cool air intake for compressors to reduce electricity usage and improve compressor efficiency. Because compressors naturally produce heat during the compression process, having cool air intakes will help a compressed air system run more efficiently due to the cooler air having a higher density than hot air.
- Implement a biogas cogeneration system using combined heat and power with anaerobic digesters. Biogas is a renewable source of energy harvested from organic waste. Facilities that reuse cogenerated biogas may be able to eliminate their natural gas usage and costs.

Pollution Prevention Benefits

Table 1: Assessment Recommendation Impacts

Recommendation	Annual Cost Savings ($/year)	Implementation Cost ($)	Payback Period (years)	Annual Utility Savings (kwh)	GHG Reduction ($MTCO_2e$/year)
Compressed Air Leak Detection	$6,938	$2,000	0.3 years	173,962	123 $MTCO_2e$
	$4,815	$23,000	4.8 years	140,382	100 $MTCO_2e$
Compressor Cool Air Intake	$5,192	$4,945	3.0 years	133,124	94 $MTCO_2e$
Compressed Air Management Plan	$35,561	$17,000	0.5 years	500,578	373 $MTCO_2e$
Upgrade Facility Lighting	$491	$1,486	3.0 years	7,557	5.4 $MTCO_2e$
Total	**$52,997**	**$48,431**	**0.9 years**	**955,603**	**695 $MTCO_2e$**